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PROGRESS REPORT

ON

BEAR VALLEY CONTROL PROJECT

MALHEUR NATIONAL FOREST

FALL OF 1940

Forest Insect Laboratory
445 U. S. Court House
Portland, Oregon
January 7, 1941

SUBJECT-

INDEX No.-

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Approved by

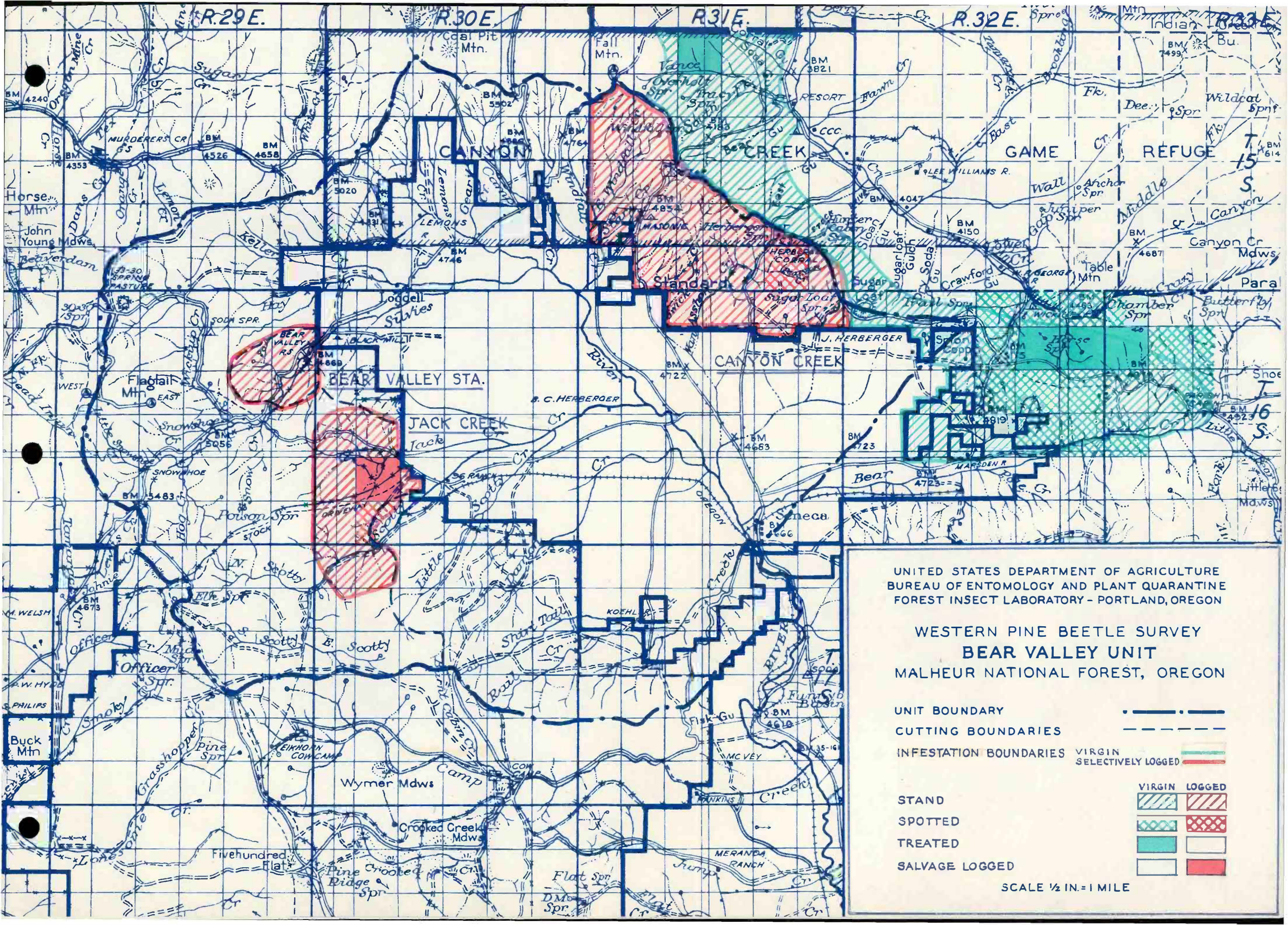
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UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
FOREST INSECT LABORATORY - PORTLAND, OREGON

WESTERN PINE BEETLE SURVEY
BEAR VALLEY UNIT
MALHEUR NATIONAL FOREST, OREGON

UNIT BOUNDARY ————
CUTTING BOUNDARIES - - - - -
INFESTATION BOUNDARIES

VIRGIN	LOGGED

STAND
SPOTTED
TREATED
SALVAGE LOGGED

SCALE 1/2 IN. = 1 MILE

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Introduction

During the years of 1931-1932 when a disastrous epidemic of the western pine beetle (Dendroctonus brevicornis Lec.) swept through the ponderosa pine stands over most of the Forest only moderate losses occurred in the stands surrounding Bear Valley. Here as elsewhere over the forest the infestation, which declined abruptly during 1933, reached a low point in 1936. During 1937 the infestation in Bear Valley again assumed an upward trend, maintained this condition through 1938 and increased sharply during 1939, becoming very aggressive in certain localities. This trend continued into the summer of 1940 in the virgin areas.

The annual pine beetle surveys of 1940 brought to light three centers in which aggressive infestations had developed to serious epidemic proportions in both virgin and selectively logged stands. Losses on check plots lying within these centers of epidemic infestation are summarized in Table No. 1. These data show that, on the virgin plot, losses mounted upwards from 46 board feet per acre in 1936 to 150 board feet per acre in 1939, an increase of 325%.

Comparable losses of board feet per acre occurred on the selectively logged plots. However, the percent of stand lost was much greater than in the virgin stand.

The 1940 survey on the selectively logged plots was made during the latter part of October, after recommendations for the control project had been made. These data, as shown in Table No. 1, although incomplete indicate a probable decline of infestation occurred during the latter part of 1940.

Purpose and Scope of Project

In view of the rapid rise of infestation (in an area that heretofore suffered only moderate losses) that was causing an alarming depletion of residual stands on selectively logged areas, and heavy losses in adjacent virgin stands, it was felt necessary to resort to artificial control measures in an attempt to halt the upward trend of the infestation and assist natural agencies in reducing the losses to a more nominal figure.

Recommendations were therefore made to inaugurate control work on three centers of epidemic infestation found to exist in both virgin and selectively logged stands.

The largest of these centers of infestation, hereinafter called "Canyon Creek," lies to the north and northeast of Bear Valley in the selectively logged stands east of Windfall Creek and in adjoining virgin stands north of Bear Creek and west of Parrish cabin. The other two centers lie in selectively logged stands to the west and southwest of the Valley. The larger of these two, hereinafter called "Jack Creek," occupies the lower reaches of Scotty and Jack Creeks. The smaller center, called "Bear Valley Station" surrounds Bear Valley Ranger Station.

The boundaries and timber types of these centers of infestation are shown on the frontismap. The approximate acreages within these boundaries, also the estimated number of infested trees to be treated, are given in Table No. 2.

Table No. 2

Units	Virgin		Cutover		Total		No. of Sections	Total Trees
	Acres	Trees	Acres	Trees	Acres	Trees		
Canyon Creek	18090	2240	10800	1180	28890		45	3430
Jack Creek			4480	490	4480		7	490
Bear Valley Sta.			1920	210	1920		3	210
Total	18090	2240	17200	1880	35290		55	4130

It was estimated there were 80 infested trees per section in the virgin stand and 70 infested trees per section in the selectively logged stands. The average volume of the insect-killed trees is roughly 700 board feet for the virgin areas and 500 board feet per tree for the selectively cut timber.

Plans of Operation

All the spotting on the project was to be carried on by personnel employed by the Forest Service.

Treating of the infested trees, however, was to be carried on jointly by the Forest Service and the Edw. Hines Lumber Co. of Burns, Ore.

It was thought that by utilizing roads constructed throughout the area during the course of selective logging operations and employing the tractor-truck method of logging the company would be able without

cost to the Forest Service to successfully salvage all of the merchantable infested timber on some 27 sections of selectively logged land, having an estimated total of 1890 infested trees, and in the Canyon Creek unit extend operations to that portion of adjacent virgin stand accessible to logging operations amounting to some 19 sections with an estimated total of 1520 infested trees. In all the company was expected to cover some 46 sections having an estimated total of 3410 infested trees. This is equivalent to approximately 2,005,000 board feet.

The Forest Service utilizing CCC labor was to treat, using the peel and burn method, all infested trees in those portions of the area inaccessible to logging operations. This was thought to amount to some 9 sections with an estimated total of 720 infested trees, containing some 500,000 board feet.

Personnel and training

Organization of personnel for the project consisted of two three-man spotting crews, one foreman in charge of treating with three assistant foremen and 50 CCC enrollees as treaters.

As this was the first pine beetle control project to be attempted on the Malheur Forest, none of the long or short term personnel on the Forest had had previous experience in this work. To assist the Forest in training its personnel the writer was assigned to the project, spending 20 days--Nov. 4 to 19 and Dec. 9 to 12--in training personnel and checking on completed work.

Personnel selected for spotting crews consisted of five local forest guards and one experienced man secured from the Ochooco National Forest. Their names are as follows: Ray Glasgow, Ochooco N. F., in charge; Martin Watson, Max O'Brian, Guy Wallingham, Leonard Beaver, and Clifford Lemons.

Training of these men began on November 5. They were given one week of intensive training as a group, then divided into two crews with the writer spending alternate days between the crews.

Personnel assigned to treating consisted of Junior Forester C. B. Angus, in charge, Foreman L. Kirkwood, and 25 CCC enrollees. Angus and Kirkwood received their initial training on November 9 and were given additional instruction on November 12 when the CCC enrollees began treating. The following week some time was spent training another foreman, Mr. Cameron, assigned to treating. During the last week of November, 25 additional CCC enrollees with another foreman, Mr. Cardwell, were assigned to the project. They were given instructions in treating by Mr. Angus, in charge.

Spotting. Plan and Progress

The plan of work for the project was to complete the more inaccessible and distant portions of the area before snow conditions would make travel difficult or impossible.

Spotting began in the virgin stand at the north end of the project in sec. 4, T. 15 S, R. 33 E., of the Canyon Creek infestation center, as this section was found to contain most of the solid infested

pine stand in this vicinity. Spotting was then shifted to the east end of the project, sec. 7, T. 16 S., R. 33, and adjacent sections also in virgin stand. Infested portions of these sections extending beyond the area boundary were also spotted.

On the selectively logged stand except for sec. 35, T. 15 S., R. 31 E., spotting is being held in abeyance pending the company's decision as to the feasibility of salvage logging on this infestation center.

One crew began spotting on the Jack Creek infestation center November 29. A fourth man, Mr. Parsons, experienced in timber marking, was placed with this crew to mark for salvage logging such beetle abandoned trees as could be salvaged together with noninfested green trees that were in a dying condition.

The number of sections covered up to December 10 are shown on the frontis map. Number of trees spotted and grouping of infestation is given in Table No. 3.

Trees Spotted as Compared with Estimates

As spotting progressed it became apparent that the number of infested trees marked per section would fall below the number estimated. In a measure this is due to the composition of the infestation in the trees.

In the virgin stand at the north end of the project, which was poor site, approximately 60% of the overwintering brood trees examined were entirely infested by flatheads (Melanophila californica V. D.)

and contained no western pine beetle, hence were not marked for treating. At the east end of the project, also the selectively logged stands of Jack Creek center, the flathead infestation was much less, probably averaging from 20 to 25% of the overwintering brood trees.

Another factor is somewhat of a decline of infestation during 1940 as indicated by survey data from selectively logged plots. The survey on these plots was carried out after recommendations for control had been made.

Table No. 4 gives a comparison of the estimated and the average number of trees spotted per section, either for control work or on the pine beetle survey, also the estimated and probable number of trees for the area.

Modification of Plans as to Logging and Treating

During the first two weeks of operation on the project, Mr. L. P. Dunford, Forester for the Edw. Hines Lumber Co., spent considerable time on the ground studying conditions as to possibilities of salvage logging in both virgin and selectively logged stands of the Canyon Creek area. Spotted and treated trees were examined as to the amount of blue stain present, log grades, and tree diameters. A summary of these studies indicated that approximately 20% of the infested trees were too small to be taken, and that 40 to 60% of the trees were so badly blue stained it would be questionable if the company could afford to salvage them, also that infested trees in the selectively logged stand of this

infestation center were largely of low quality, as most of the high quality trees had been removed under the Economic System of selective marking, and that only railroads had been built into the area during the selective logging. Most of these grades followed stream bottoms, which with the present saturated soil conditions, due to the unusually wet fall, would require considerable preparation before loaded trucks could negotiate them, also that no road suitable for truck logging existed to, or in the virgin stands.

In view of these conditions, and infestation somewhat less than anticipated, the company decided to defer salvage operations on the Canyon Creek unit until the Company's forester could ascertain the distribution, volume and quality of the timber to be salvaged.

Even though the Company should decide to salvage infested trees on the selectively logged portion of the Canyon Creek infestation center, it is questionable if they would attempt operations in the virgin stand, due to the absence of suitable truck roads and distance to haul. In view of this situation, and since fewer trees were spotted for treating than estimated, the Forest Service decided to extent treating operations to cover as much of the virgin stand as the available CCC labor and the special funds for supervisory foremen permitted.

It is improbable that salvage logging will be attempted on the Bear Valley Station center, due to the lack of truck roads, low quality of timber, as these stands were logged under the Economic System of marking, and rough terrain.

Treating

Treating by the CCC began on sec. 4, T. 15 S., R. 31 E. As no additional acreage was spotted at this end of the project, operations were therefore moved to sec. 12, T. 16 S., R. 32 E., and adjacent sections in the virgin stand at the east end of the project.

At first the work progressed slowly due to rough terrain and inexperience of the enrollees. As all were recruited from New York and other large cities they were totally unfamiliar with tools and woodcraft. As they gained experience production began improving. The quality of their work was excellent at all times.

Up to December 12, 906 CCC enrollee man days were expended to treat 227 infested trees on 2560 acres. It is expected that the production per man per day will increase considerably before the completion of the project.

Sections treated are shown on frontis map.

Salvage Logging

On the Jack Creek infestation center conditions were found to be more favorable than on the other two centers. Distances to skid logs to rail or truck roads were usually not excessive. Quality of timber was better, this stand having been logged under the so-called Silvicultural Method of marking. Bluestain appeared not to be excessive, and would permit a few high quality beetle abandoned trees to be salvaged also.

Logging on this center got under way during the first week of December. By December 12 salvage logging had been completed on sec. 29, T. 16 S., R. 30 E., and some logs taken from adjacent sections.

Of the 105 trees spotted on sec. 29, 60 were salvaged and the remaining 45 were not taken because of small diameter size or excessive bluestain. Defect and low quality also eliminated a few.

In addition to the infested trees a small number of high quality beetle abandoned trees were salvaged. Also a few green trees of very low and declining thrift were taken out. These green trees were actually in a dying condition.

Table No. 1
Summary of Data from Check Plots within Infestation Centers

Year of Loss	1936				1937				1938				1939				Probable 1940		
	Trees Per Section	Bd. Ft. Per Acre	Percent of Stand	Ratio 1937 to 1936	Trees Per Section	Bd. Ft. Per Acre	Percent of Stand	Ratio 1938 to 1937	Trees Per Section	Bd. Ft. Per Acre	Percent of Stand	Ratio 1939 to 1938	Trees Per Section	Bd. Ft. Per Acre	Percent of Stand	Ratio 1940 to 1939	Trees per Section	Bd. Ft. Per Acre	Percent of Stand
Plot Location																			
<u>Virgin stand</u>																			
Canyon Creek																			
T16S R32E Sec. 14 E $\frac{1}{2}$	56	46	.31	1.69	70	78	.53	1.04	72	81	.56	1.85	172	150	1.04	1.13	176	170	1.18
<u>40% cut over</u>																			
Canyon Creek																			
T15S R31E Sec. 20 W $\frac{1}{2}$					76	55	.63	2.40	116	132	1.54	.90	130	119	1.40	.90	74	63	.75
T15S R31E Sec. 35 W $\frac{1}{2}$					44	29	.32	3.27	152	95	1.09	1.67	170	159	1.84	.38	102	61	.73
Jack Creek																			
T16S R30E Sec. 29 E $\frac{1}{2}$									172	127	.92	1.92	314	244	1.77	.82	220	200	1.08
Bear Valley Station																			
T16S R29E Sec. 12 S $\frac{1}{2}$					36	45	.66	.58	62	26	.39	2.27	102	59	.83	.63	86	37	.57

Table No. 3
Summary of Spotting

T	R	Sec	Date	Acresage	Total Trees	Number of Single Trees	No. Groups of 2 Trees	No. Groups of 3 to 5 Trees	No. Groups of 6 to 10 Trees	No. Groups of 11 to 15 trees	No. Groups of 16 to 20 Trees
<u>Canyon Creek—Virgin</u>											
15	31	4	11-6	500	31	19	3	1			
16	33	7	11-8	640	93	33	2	3	3	1	
16	32	11	11-15	640	61	31	4	7			
16	32	12	11-8	640	67	39	5	5			
16	33	8	11-13	640	70	27	7	5	1		
16	33	18	11-13	160	10	4			1		
16	32	10	11-18	640	43	23	2	3	1		
16	33	17	11-19	320	25	11	3	2			
16	33	9	11-20	320	21	15	1	1			
16	32	15	11-20	640	51	25	4	3	1		
16	33	16	11-22	320	31	11	1	2		1	
16	32	22	11-23	200	13	3	3	1			
16	32	3	11-25	640	48	29	5	3			
16	32	14	11-26	640	53	22	4	5	1		
16	32	13	11-26	640	55	18	3	7	1		
16	32	5	11-28	160	16	4	1	3			
16	32	6	11-28	160	4	4	2	1			
16	32	24	11-29	600	73	19	2	8	3		
16	32	23	12-3	640	57	31	4	3	1		
16	33	19	12-4	480	19	1		3	1		
16	32	2	12-5	640	20	8	3	2			
16	32	1	12-6	640	32	18	1	4			
16	32	6	12-8	320	23	9	4	2			
16	32	15	12-10	640	51	26	4	3	1		
Total				11,960	967	430	63	77	15	2	
19 Sections; Average of 51 trees per section											
<u>Canyon Creek—Cut Over</u>											
15	31	35	11-14	640	38	26		3			
Total Canyon Creek				12,600	1005	456					

T	R	Sec	Spotted	Spotted	Spotted	Single Trees	2 Trees	3 to 5 Trees	6 to 10 Trees	11 to 15 trees	16-20 Trees
Total Canyon Creek			12,600	1,005	456						
<u>Jack Creek—Cut Over</u>											
16	30	29	12-2	520	105	34	8	6	3		
16	30	32	12-6	260	25	7	4	3			
17	30	6	12-10	80	11	5					
Total			860	141	46	12	9	3			
Total spotted— all units			13,460	1,146							
21 sections; Average of 55 trees per section											

Table No. 4
Comparison of Estimated and Average Number Trees Per Section
Also Estimated and Probable Number of Trees on Area

Infestation Center	Virgin		Cut Over		Total Trees on Area			
	Average No. of Trees per Sec.		Average No. of Trees per Sec.		Estimated		Probable	
	Estimated	Spotted	Estimated	Spotted	Virgin	Total	Virgin	Total
Canyon Creek	80	52	70	40	2240	3430	1450	2137
Jack Creek			70	57		490		400
Bear Valley Station			70	68		210		204
Total					2240	4130	1450	2741